

Application No.: 09/961,395
Attorney Docket No.: 021123-0265258

REMARKS

I. Status of the claims

Claims 1-5, 7-9, and 11-19 are pending. No claims have been amended in this response.

A unsigned declaration under 37 C.F.R. § 1.132 by Harald Jakob is being submitted with this response. A signed copy of the declaration will be submitted shortly thereafter. As the declaration is being timely submitted prior to a final Office Action, Applicants respectfully request that the examiner enter the declaration into the record and consider the declaration in its entirety.

II. Rejections under 35 U.S.C. § 103(a)

Claims 1-3, 5, 7-9, and 11-19 are rejected by the examiner under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,560,896 to Bewersdorf et al. ("Bewersdorf '896") in view of U.S. Patent No. 5,714,201 to Bewersdorf et al. ("Bewersdorf '201"); claims 1-3, 5, 7-9, and 11-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bewersdorf '896 in view of U.S. Patent No. 4,428,914 to Brichard et al. ("Brichard") and further in view of Bewersdorf '201; and claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bewersdorf '896 in view Brichard and further in view of Bewersdorf '201, or Bewersdorf '896 in view of Bewersdorf '201 and further in view of U.S. Patent No. 6,413,927 to Horne et al. ("Horne"). Applicants respectfully traverse these rejections.

With this response, Applicants have filed a declaration under 37 C.F.R. § 1.132 by Harald Jakob, the lead inventor of this application. The data on page 2 of the declaration demonstrates surprising and unexpected synergistic results obtained using a magnesium compound in an amount ranging from 125-1000 ppm in conjunction with waterglass in an amount ranging from 0.1-1.0 wt.%. Specifically, the data shows that using 0.1-1.0 wt.% waterglass in combination with 125-1000 ppm magnesium provides products having better TAM values than (a) products prepared using only waterglass, and (b) products prepared using only magnesium sulfate. As is well known in the art, a low TAM value is a prerequisite for a safe storage of sodium percarbonate in a silo.

As set forth in the declaration, small amounts of both MgSO_4 and SiO_2 synergistically produce better results (low TAM values) than using the correspondingly same amounts of SiO_2 alone. For instance, a product obtained using only 0.5 wt.% SiO_2 is shown to have a

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TAM value of 7.8 $\mu\text{W/g}$. If the reaction mixture is augmented with an additional 0.5 wt.% SiO_2 —resulting in a product obtained using 1.0 wt.% SiO_2 —the TAM value is only decreased minimally to 7.6 $\mu\text{W/g}$. However, if the reaction mixture is augmented with an additional 0.5 wt.% magnesium sulfate—resulting in a product obtained using 0.5 wt.% SiO_2 and 0.5 wt.% MgSO_4 (1000 ppm Mg)—the TAM value drops considerably to 4.1 $\mu\text{W/g}$. In both cases, the same wt.% of total product is used (1.0), with the synergistic relationship between the waterglass and magnesium providing the improvement in TAM value.

The declaration also demonstrates that small amounts of both MgSO_4 and SiO_2 synergistically produce better results than using correspondingly similar amounts of MgSO_4 alone. For instance, a product obtained using only 0.13 wt.% (250 ppm) MgSO_4 is shown to have a TAM value of 18.3 $\mu\text{W/g}$. If the reaction mixture is augmented with an additional 0.37 wt.% (750 ppm) MgSO_4 —resulting in a product obtained using 0.5 wt.% (1000 ppm) MgSO_4 —the TAM value is only decreased to 11.1 $\mu\text{W/g}$. However, if the reaction mixture is augmented with an additional 0.5 wt.% SiO_2 —resulting in a product obtained using 0.13 wt.% MgSO_4 (250 ppm Mg) and 0.5 wt.% SiO_2 —the TAM value drops considerably to 5.0 $\mu\text{W/g}$. In both cases, the similar wt.% of total product is used (0.5 vs. 0.63), with the synergistic relationship between the waterglass and magnesium providing the improvement in TAM value. Also note that augmenting the formulation with *less* SiO_2 , for instance 0.25 wt.% SiO_2 , still produces a product having a reduced TAM value, in this case 7.2 $\mu\text{W/g}$ (product obtained using 0.13 wt.% MgSO_4 (250 ppm Mg) and 0.25 wt.% SiO_2).

The declaration additionally demonstrates that smaller amounts of SiO_2 and MgSO_4 synergistically produce lower TAM values than larger amounts of SiO_2 or MgSO_4 alone. For instance, a product obtained using only 0.5 wt.% (1000 ppm) MgSO_4 is shown to have a TAM value of 11.1 $\mu\text{W/g}$, and a product obtained using only 1.0 wt.% SiO_2 is shown to have a TAM value of 7.6 $\mu\text{W/g}$. However, a product obtained using a quarter of both of those amounts—a product obtained using 0.13 wt.% (250 ppm) MgSO_4 and 0.25 wt.% SiO_2 —has a TAM value of 7.2 $\mu\text{W/g}$. Hence, because of the synergy between the MgSO_4 and the SiO_2 , a product with a lower TAM value is produced even though significantly less MgSO_4 and SiO_2 is used.

The data in the declaration thus demonstrates the synergistic effect of using 0.1-1.0 wt.% waterglass in combination with 125-1000 ppm magnesium. The exemplified combinations discussed above show that waterglass and magnesium, when combined in the

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claimed ranges, produce better results that correspondingly similar amounts of either waterglass alone or magnesium sulfate alone. Additional synergistic combinations may also be seen on in the data submitted in the declaration.

The synergistic relationship between waterglass and magnesium could not have been predicted from the art cited by the examiner. While Bewersdorf '201 discloses combinations of magnesium sulfate and waterglass, the data reporting this combination only shows active oxygen (Oa) retention. There is no discussion in Bewersdorf '201 relating to TAM values. While Oa retention is a good indicator of the storage stability of sodium percarbonate in detergent formulations, such as the detergent formulations in Bewersdorf '201, Oa retention is not as useful for determining the storage stability of sodium percarbonate in a silo, the use of Applicants' claimed invention. To determine the storage stability of sodium percarbonate in a silo, TAM values should be measured. See page 3, line 27 to page 4, line 13 of the specification.

Furthermore, there is no correlation between active oxygen stability and TAM values. Horne, one of the references cited by the examiner, provides a good example of the lack of correlation between these values. In Table 5, Horne measures both TAM values, designated by Horne as LKB40, and active oxygen stability in detergent formulations, designated by Horne as Avox Recovery. As can be seen by comparing the LKB40 data and the Avox Recovery, little to no correlation appears to exist between active oxygen stability and TAM values. See col. 19, lines 27-45.

The other references relied upon by the examiner similarly fail to relate to TAM values or use a measurement from which a skilled artisan could deduce TAM values. Brichard measures the stability in sodium percarbonate as the loss of active oxygen during storage for two hours at 105° C. See col. 9, lines 42-45. This measurement value is not suitable to draw any conclusions with regard to the TAM value because the TAM value is measured at 40° C. Heating the sodium percarbonate to 105° C will irreversibly change the TAM value of the material. See, for example, U.S. Patent Application No. 2002/0127168, page 4, paragraph 54 and Table 1. Likewise, Bewersdorf '896 uses active oxygen (Oa) content of the discarded, moist sodium percarbonate (see Table 1) and discusses the "active oxygen stability" without any further indication of how this property is measured.

Therefore, a skilled artisan would not be able to look to Bewersdorf '201, Bewersdorf '896, or Brichard to determine TAM values or otherwise make any type of assessment as to

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whether the disclosed compositions provide storage stability of sodium percarbonate in a silo. In view of the lack of correlation between active oxygen stability and TAM values, one skilled in the art would not find the Oa retention values disclosed in Bewersdorf '201, the Oa content disclosed Bewersdorf '896, or the loss of active oxygen disclosed Brichard to be relevant factors when predicting TAM values. Certainly, the references would not lead a skilled artisan to conclude that a composition containing magnesium compound in an amount ranging from 125-1000 ppm in conjunction with waterglass in an amount ranging from 0.1-1.0 wt.% would synergistically increase storage stability of sodium percarbonate in a silo.

The synergistic results demonstrated in the declaration would not have been predicted by a skilled artisan studying the prior-art references cited by the examiner. The references do not discuss TAM values, but rather only measure the active oxygen stability, which, as discussed above, is not correlated with TAM values. Therefore, the active oxygen stability data would not lead a skilled artisan to conclude that the disclosed compositions would have improved TAM values or would otherwise possess improved storage-stability properties of sodium percarbonate in a silo.

Applicants respectfully submit that the synergistic results set forth in the declaration together with the above remarks overcome the examiner's *prima facie* case of obviousness. Accordingly, Applicants respectfully request that the examiner withdraw the outstanding rejections under 35 U.S.C. § 103(a).

Additionally, there are other reasons that the cited art does not render obvious Applicants' claimed invention.

First, Bewersdorf '896 does not disclose the combined use of a magnesium salt and waterglass. In col. 7, lines 12-21, Bewersdorf '896 discloses that additives can be added to the H_2O_2 solution and/or Na_2CO_3 solution in a process for making sodium percarbonate by fluid-bed spray granulation. Such additive include oxygen stabilizers, crystallization retarders and surface-active substances. Magnesium salts and waterglass are disclosed as potential additives which elevate active oxygen stability, however, this disclosure gives no indication that such a combined use could have any advantage over using only one of the two disclosed stabilizers.

Second, the process disclosed in Bewersdorf '896 produces a product coated with magnesium or waterglass. By the very nature of a coating, Bewersdorf '896 does not contain

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waterglass evenly distributed throughout the sodium percarbonate particles. Applicants' claimed process, on the other hand, inevitably leads to a product having waterglass evenly distributed throughout the sodium percarbonate particles; Applicants do not add the magnesium salt or waterglass to solutions used for *coating* sodium percarbonate particles.

Third, Bewersdorf '201 does not suggest the combined use of waterglass and a magnesium salt in a process for making granular sodium percarbonate. Rather, Bewersdorf '201 only suggests to use waterglass with a modulus in the range from less than 3 to greater than 1 and in a quantity of between 0.1 and 5 wt.% in the process of Bewersdorf '896. See col. 3, lines 11-56. The combination of waterglass and a magnesium salt is disclosed only for a process for coating sodium percarbonate. See col. 3, line 66 to col. 4, line 30. Such a process differs from Applicants' claimed process for making sodium percarbonate in that no hydrogen peroxide solution is sprayed and therefore no more sodium percarbonate can be formed.

Fourth, Brichard teaches that a condensed phosphate additive must be added to prepare storage-stable sodium percarbonate when using magnesium sulfate and sodium silicate. While Brichard is directed to the preparation of sodium percarbonate, which is storage stable (see col. 1, line 66 to col. 2, line 3), Brichard contains a clear teaching that the use of a condensed phosphate additive is necessary for obtaining sodium percarbonate with improved stability. See col. 7, lines 4-10. Therefore, a skilled artisan would not expect the combination of magnesium sulfate and sodium silicate alone—without the use of condensed phosphate additive—to be successful in preparing storage-stable sodium percarbonate. This is demonstrated by comparative example 7R, which demonstrates that omitting the condensed phosphate leads to a product with inferior stability. Consequently, a skilled artisan would not have no motivation to combine the magnesium sulfate and sodium silicate in the amounts disclosed in Brichard with the teachings of Bewersdorf '896 and Bewersdorf '201 without also using a condensed phosphate additive, as recited in Applicants' claimed process. In view of the teachings of Brichard relating to the essential use of a condensed phosphate additive, a skilled artisan would not have a reasonable expectation of success for obtaining a storage-stable sodium percarbonate product in the absence of the condensed phosphate additive.

For these additional reasons, Applicants respectfully request that the examiner withdraw the outstanding rejections under 35 U.S.C. § 103(a).

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Should any issues remain unresolved, the examiner is encouraged to contact the undersigned attorney for the applicants at the telephone number indicated below in order to expeditiously resolve any remaining issues.

Respectfully submitted,

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